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भाग 2 पाइप पेंच वाली चूड़ियाँ जी, आर पी और आर सी शृंखला

Indian Standard

SCREWING TAPS — DIMENSIONS AND TOLERANCES OF THREADED PORTION

PART 2 FOR PIPE SCREW THREADS G, R_p AND R_c SERIES

UDC 621·993 : 621·882·082·22 : 006·78

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NEW DELHI 110002

March 1992 Price Group 3

Thread Cutting Taps and Dies Sectional Committee, PE 13

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by Thread Cutting Taps and Dies Sectional Committee had been approved by the Production Engineering Division Council.

This standard has been published to cover the tolerance and dimensions of threaded portion of pipe thread screwing taps. Earlier this was covered in IS 6172 : 1979 'Hand taps for pipe threads, parallel' and in IS 7796 : 1975 'Hand taps for pipe threads, taper'. Now these standards have been revised as IS 6175 (Part 6) : 1991, IS 6175 (Part 7) : 1991 and IS 6175 (Part 8) : 1991 covering only general dimensions. These changes have been made in order to bring uniformity in other related Indian Standards on screwing taps.

Considerable assistance has been derived from ISO 5969-1979 'Ground thread taps for pipe threads G and Rp series — Tolerance on threaded portion' issued by the International Organization for Standardization (ISO).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 JANUARY 1996
TO
IS 6173 (Part 2) : 1992 SCREWING TAPS — DIMENSIONS AND TOLERANCES OF THREADED PORTION

PART 2 FOR PIPE SCREW THREADS G, Rp AND Rc SERIES

Typographical errors have crept in the text of this standard as far as 'year of printing' is concerned. Year of printing shall be read as '1992' in place of '1991' in the text of the following Indian Standards wherever it appears:

IS 6171, IS 6173 (Part 1) and IS 6175 (Parts 6 to 8).

(*Page* 3, *Table* 1, *col 'Formula' for Tolerance on Major Diameter of Tap* d_B) — Substitute 'd_B *Min* = $d_B + m_c$' *for* 'd_b *Min* = $d_B + m_c$' *for* G, R_p and R_c Series.

(*Page* 4, *Table* 2, *col* 7, *Row* 3) — Substitute '12.351' *for* '11.351'.

(*Page* 4, *Table* 2, *col* 8, *Row* 11) — Substitute '38.952' *for* '38.852'.

(PE 10)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SCREWING TAPS — DIMENSIONS AND TOLERANCES OF THREADED PORTION

PART 2 FOR PIPE SCREW THREADS G, R_p AND R_c SERIES

1 SCOPE

This standard covers the dimensions and tolerances on threaded portion of screwing taps for pipe threads of G series, conforming to IS 2643 (Part 1) : 1975 'Dimensions for pipe threads for fastening purposes : Part 1 Basic profile and dimensions', IS 2643 (Part 2) : 1975, Part 2 Tolerances and IS 2643 (Part 3) : 1975, Part 3 Limits of sizes (*first revision*); R_p and R_c series conforming to IS 554 : 1985 'Dimensions for pipe threads where pressure tight joints are made on threads (*third revision*)'.

2 REFERENCES

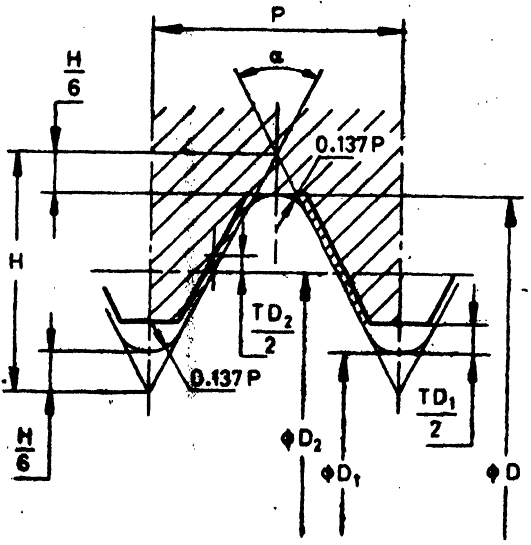
The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
554 : 1985	Dimensions for pipe threads where pressure tight joints are made on threads (*third revision*)
2643	Dimensions for pipe threads for fastening purposes:
(Part 1) : 1975	Basic profile and dimensions
(Part 2) : 1975	Tolerances
(Part 3) : 1975	Limits of sizes (*first revision*)
6171 : 1991	Screwing taps — Technical supply conditions
6173 (Part 1) : 1991	Screwing taps — Dimensions and tolerances on threaded portion : Part 1 For ISO metric screw threads

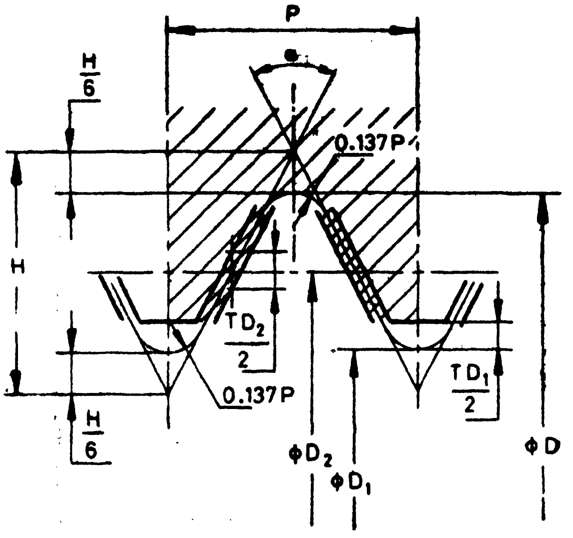
3 BASIC DATA

3.1 Thread Profile of Nuts

Thread profile of threaded hole with zero minimum clearance on the pitch diameter shall be as shown below:



G-Series



R_p & R_c Series

D — Basic major diameter or nominal diameter

D_1 — Basic minor diameter

D_2 — Basic pitch diameter

P — Pitch of the thread

H — Height of the fundamental triangle

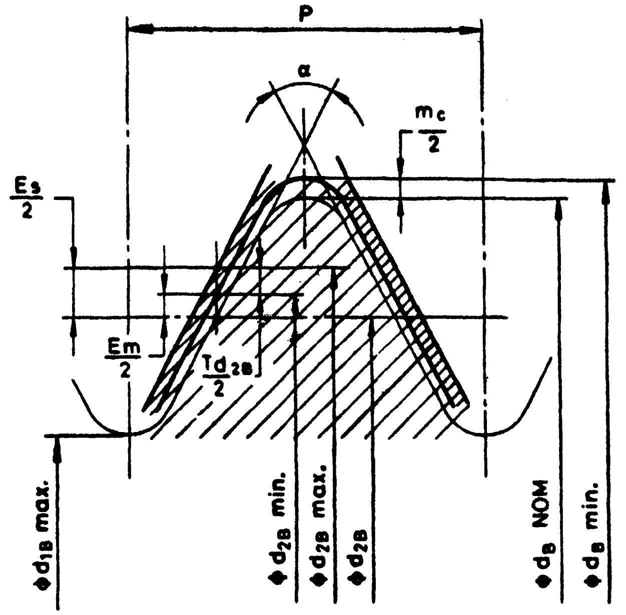
α — Flank angle of the thread

T_{D1} — Minor diameter tolerance

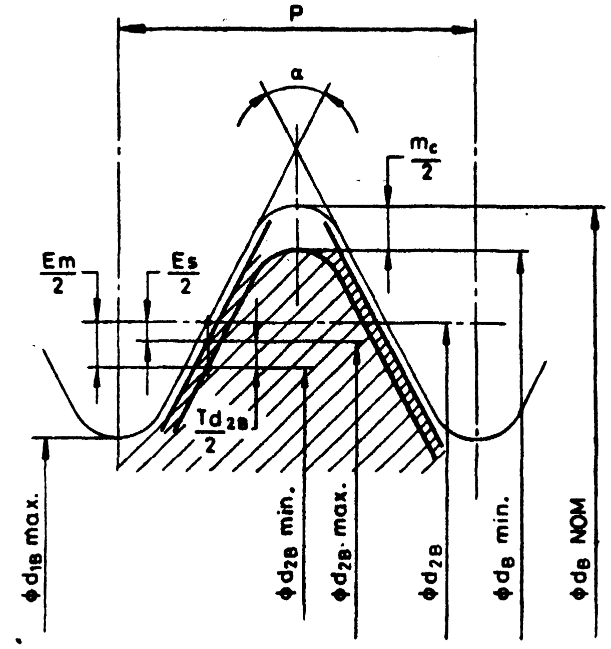
T_{D2} — Pitch diameter tolerance

3.2 Thread Profile of Screwing Tap

Thread profile of screwing taps for tapping threaded hole with zero minimum clearance on the pitch diameter.



G-Series



Rp and Rc Series

d_B NOM — Nominal major diameter
d_B *Min* — Minimum major diameter
d_{2B} — Basic pitch diameter
d_{2B} *Min* — Minimum pitch diameter
d_{2B} *Max* — Maximum pitch diameter
d_{1B} *Max* — Maximum minor diameter
mc — Minimum clearance (allowance for wear)
Es — Upper deviation of pitch diameter
Em — Lower deviation of pitch diameter
Td_{2B} — Tolerance on pitch diameter
P — Pitch of the thread

4 TOLERANCE CLASSES OF SCREWING TAPS

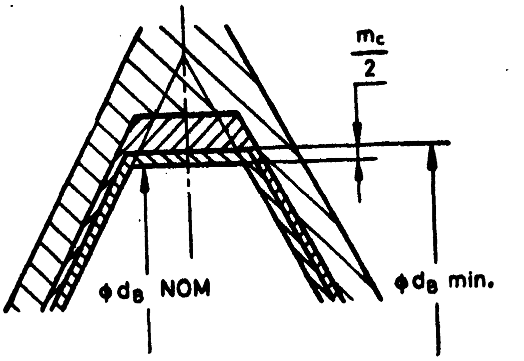
4.1 IS 2643 (Parts 1 to 3) : 1975 and IS 554 : 1985 each specify one class of nut. Hence only one class of screwing taps for each of the standards have been provided. The tolerance for these screwing taps are determined in terms of tolerance unit *t*, the value of which is equal to the nut pitch diameter tolerance T_{D_2}.

5 SCREWING TAP THREAD ELEMENTS

5.1 The formulae for calculating thread profile dimensions are covered in Table 1.

5.2 Major Diameter d_B

To compensate for the wear on screwing tap, the minimum major diameter d_B *Min* is equal to the nominal diameter *D* of nut thread plus deviation m_0. The maximum diameter of d_B has not been specified and is left to the discretion of manufacturer.



5.3 Pitch Diameter d_{2B}

The tolerance for pitch diameters of different series are covered in Table 1.

5.4 Minor Diameter d_{1B}

No tolerance has been provided on this diameter. However, the root of thread shall lie within triangle ABC and the profile of the roots shall blend with the flanks.

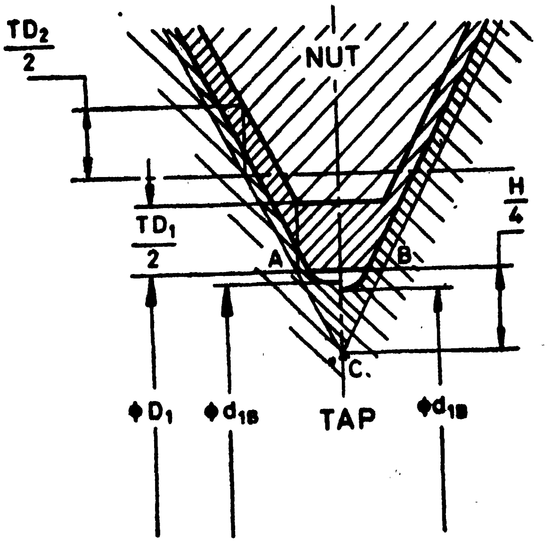
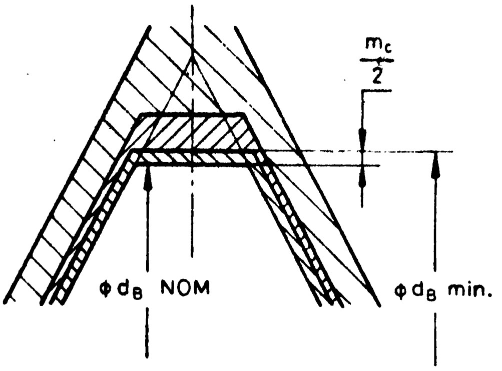
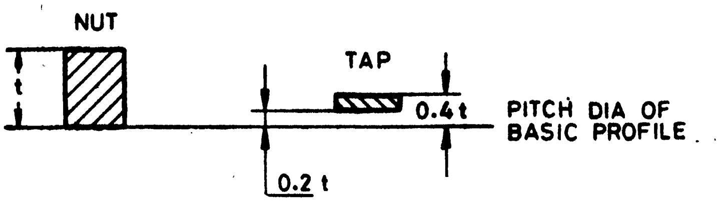
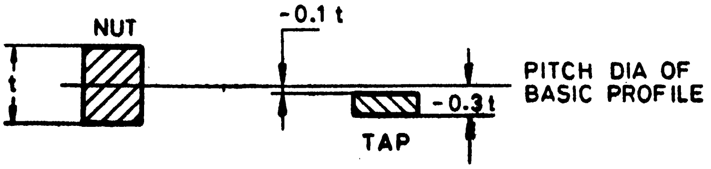
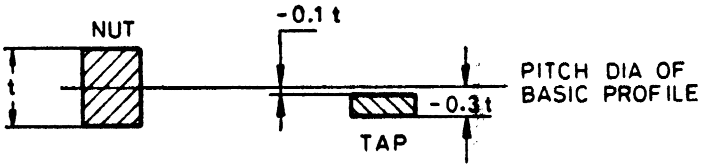


Table 1
(*Clause* 5.1)

Types of Taps	Position of Tolerance Zone	Formula
		Tolerances on Major Diameter of Tap d_B
G Series		$m_c = 0{\cdot}3\,t$(1) $d_b\,Min = d_B + m_c$
Rp Series		$m_c = 0{\cdot}3\,t$(1) $d_b\,Min = d_B + m_c$
Ro Series		$m_c = 0{\cdot}3\,t$(1) $d_b\,Min = d_B + m_c$
		Tolerances on Pitch Diameter of Tap d_{2B}
G Series	 NUT t TAP 0.4 t 0.2 t PITCH DIA OF BASIC PROFILE	$E_m = 0{\cdot}2\,t$ $E_s = 0{\cdot}4\,t$ $d_{2B}\,Min = D_2 + E_m$ $d_{2B}\,Max = D_2 + E_s$
Rp Series	 NUT t -0.1 t -0.3 t TAP PITCH DIA OF BASIC PROFILE	$E_m = 0{\cdot}3\,t$ $E_s = 0{\cdot}1\,t$ $d_{2B}\,Min = D_2 - E_m$ $d_{2B}\,Max = D_2 - E_s$
Ro Series	 NUT t -0.1 t -0.3 t TAP PITCH DIA OF BASIC PROFILE	$E_m = 0{\cdot}3\,t$ $E_s = 0{\cdot}1\,t$ $d_{2B}\,Min = D_2 - E_m$ $d_{2B}\,Max = D_2 - E_s$

(1) The tolerances have been determined in terms of a tolerance unit t. The value of which is equal to the nut pitch diameter tolerance T_{D2}.

6 THREAD PROFILE DIMENSIONS

6.1 The calculated values of thread profile dimensions for Taps *G*, R_p and R_0 series are covered in Annex A.

6.2 Tolerances on pitch and half flank angle shall be according to IS 6173 (Part 1) : 1991 in the same pitch ranges.

6.3 The tolerances on the other elements of the tap shall be according to IS 6171 : 1991.

ANNEX A

(*Clause* 6.1)

THREAD PROFILE DIMENSIONS

A-1 Dimensions for threaded portion of srcewing taps for *G* series pipe threads are given in Table 2.

A-2 Dimensions for threaded portion of screwing taps for R_p series pipe threads are given in Table 3.

A-3 Dimensions for threaded portion of screwing taps for R_c series pipe threads are given in Table 4.

Table 2 Dimensions for Threaded Portion of Taps of G Series Pipe Threads

(*Clause* A-1)

Designation	Nominal Dia D	Pitch P	Major Diameter d_B *Min*	Pitch Diameter d_{2B}			Minor Diameter d_{1B} *Max*
				Nom	*Min*	*Max*	
G1/16	7·723	0·907	7·755	7·142	7·163	7·185	6·561
G⅛	9·728	0·907	9·760	9·147	9·168	9·190	8·566
G¼	13·157	1·337	13·194	12·301	12·326	11·351	11·445
G⅜	16·662	1·337	16·699	15·806	15·831	15·856	14·950
G½	20·955	1·814	20·998	19·793	19·821	19·850	18·631
G⅝	22·911	1·814	22·954	21·749	21·777	21·806	20·587
G¾	26·441	1·814	26·484	25·279	25·307	25·336	24·117
G⅞	30·201	1·814	30·244	29·039	29·067	29·096	27·877
G1	33·249	2·309	33·303	31·770	31·806	31·842	30·291
G1⅛	37·897	2·309	37·951	36·418	36·454	36·490	34·939
G1¼	41·910	2·309	41·964	40·431	40·467	40·503	38·852
G1½	47·803	2·309	47·857	46·324	46·360	46·395	44·845
G1¾	53·746	2·309	53·800	52·267	52·303	52·339	50·788
G2	59·614	2·309	59·668	58·135	58·171	58·207	56·656
G2¼	65·710	2·309	65·775	64·231	64·274	64·318	62·752
G2½	75·184	2·309	75·249	73·705	73·748	73·792	72·226
G2¾	81·534	2·309	81·599	80·055	80·098	80·142	78·576
G3	87·884	2·309	87·949	86·405	86·448	86·492	84·926
G3½	100·330	2·309	100·395	98·851	98·894	98·938	97·372
G4	113·030	2·309	113·095	111·551	111·594	111·638	110·072

Table 3 Dimensions for Threaded Portion of Taps for R_p Series Pipe Threads

(*Clause* A-2)

Designation	Nominal Dia D	Pitch P	Major Diameter d_B *Min*	Pitch Diameter d_{2B}			Minor Diameter d_{1B} *Max*
				Nom	*Min*	*Max*	
Rp 1/16	7·723	0·907	7·680	7·142	7·099	7·128	6·561
Rp ⅛	9·728	0·907	9·685	9·147	9·104	9·133	8·566
Rp ¼	13·157	1·337	13·094	12·301	12·238	12·280	11·445
Rp ⅜	16·662	1·337	16·599	15·806	15·743	15·785	14·950
Rp ½	20·955	1·814	20·869	19·793	19·707	19·764	18·631
Rp ¾	26·441	1·814	26·355	25·279	25·193	25·250	24·117
Rp 1	33·249	2·309	33·140	31·770	31·661	31·733	30·291
Rp 1¼	41·910	2·309	41·801	40·431	40·322	40·394	38·952
Rp 1½	47·803	2·309	47·694	46·324	46·215	46·287	44·845
Rp 2	59·614	2·309	59·505	58·135	58·026	58·098	56·656
Rp 2½	75·184	2·309	75·054	73·705	73·575	73·662	72·226
Rp 3	87·884	2·309	87·754	86·405	86·275	86·362	84·926
Rp 4	113·030	2·309	112·900	111·551	111·421	111·508	110·072

Table 4 Dimensions for Threaded Portion of Taps for R_c Series Pipe Threads

(*Clause* A-3)

Designation	Nominal Dia D	Pitch P	Major Diameter d_B *Min*	Pitch Diameter d_{2B}			Minor Diameter *Max* d_{1B}
				Nom	*Min*	*Max*	
Rc 1/16	7·723	0·907	7·764	7·142	7·162	7·190	6·561
Rc ⅛	9·728	0·907	9·769	9·147	9·166	9·194	8·566
Rc ¼	13·157	1·337	13·203	12·301	12·324	12·355	11·445
Rc ⅜	16·662	1·337	16·708	15·806	15·829	15·862	14·950
Rc ½	20·955	1·814	21·011	19·793	19·821	19·857	18·631
Rc ¾	26·441	1·814	26·497	25·279	25·307	25·345	24·117
Rc 1	33·249	2·309	33·310	31·770	31·801	31·841	30·291
Rc 1¼	41·910	2·309	41·971	40·431	40·462	40·508	38·952
Rc 1½	47·803	2·309	47·864	46·324	46·355	46·403	44·845
Rc 2	59·614	2·309	59·675	58·135	58·166	58·217	56·656
Rc 2½	75·184	2·309	75·245	73·705	73·736	73·792	72·226
Rc 3	87·884	2·309	87·945	86·405	86·436	86·495	84·926
Rc 4	113·030	2·309	113·019	111·551	111·582	111·642	110·072

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